sector whose utilization exceeds a predetermined threshold, after checking with the nearest co-channel cells for potential interference on the reallocated channels.

Claim 1 is illustrative.

> 1. A method for allocating channels in a cell of a cellular communication system having a plurality of cells comprising:
> a. dividing the cell into a plurality of sectors;
> b. subdividing channels allocated to the cell into frequency subgroups;
> c. assigning the frequency subgroups to respective sectors in the cell;
> d. allocating channels within each sector to users in the corresponding sector;
> e. when the number of channels allocated in a first sector of the cell reaches a predetermined threshold, reassigning an unused channel from a second sector in the cell to the first sector.

The Examiner rejected independent claim 1 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,047,186 to Yu et al. (hereinafter, "Yu"), in view of U.S. Patent 5,809,423 to Benbeniste (hereinafter, "Benbeniste"). Yu discloses a method of mapping cell sector boundaries to real-world performance characteristics, either by taking physical measurements of signal strength vs. position (e.g., by "drive tests") or via computer simulation. Yu, col. 8,11. 17-22. These real-world sectors are grouped into "islands" or "regions" separated by weak connection zones. Yu, col. 9,1. 66 - col. 10, I. 7. Channel groups are then assigned to cell sectors, independently within each region, by optimizing the ratio of received signal strength to interference power within each sector. Yu, col. 15,11. 12-20.

Yu discloses no dynamic allocation of channels. The Examiner relied on Benbeniste for that teaching. Benbeniste discloses an Adaptive-Dynamic Channel Assignment (ADAC). Benbeniste, col. 7,11. 48-60. In the Adaptive phase of

Benbeniste's channel allocation, frequency groups are assigned to cells based not on a fixed re-use pattern, but rather according to measured or anticipated traffic loads within each cell, reallocating at up to half-hour intervals as necessary. Benbeniste, col. 6,11. 49-65. In the Dynamic phase, one cell may borrow an unused channel from another cell as its load increases. Benbeniste, col. 7, l. 60 - col. 8, l. 8.

The PTO has the burden under § 103 to establish a *prima facie* case of obviousness. It can satisfy this burden only by showing some objective teaching in the prior art, or that knowledge generally available to one of ordinary skill in the art, would lead that individual to combine the relevant teachings of the references. *In re Fine,* 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. *ACS Hosp. Sys., Inc. v. Montefiore Hosp.,* 732 F.2d 1572, 221 USPQ 929, (Fed. Cir. 1984). Not only is there no motivation in either reference, or in the art, to make the asserted combination, the combination would not in fact "provide a method in which channels can be allocated in an efficient matter [sic] maximizing traffic capacity," as the Examiner asserted. Nor would the combination yield Applicant's invention.

Benbeniste teaches channel borrowing among cells within a network - not sectors within a cell - and it teaches this <u>only</u> in the context of an <u>adaptive</u> cell channel allocation scheme.

> The channel borrowing algorithm in ADCA differs from traditional channel borrowing in that <u>the channel allocation is not regular</u>. It is non-regular, just as in adaptive channel assignment. Because of

> channel borrowing, ADCA can adjust channel capacity to randomly-induced variations in traffic, as well as to traffic trend changes. Benbeniste, col. 8,11. 9-14, emphasis added.

Adaptive channel allocation is antithetical to the very inventive concept of Yu. Yu teaches constructing cell sector boundaries that accurately reflect real-world performance characteristics, and then carefully allocating specific channel groups to each sector according to a complex, recursive algorithm so as to optimize the signal/interference performance in each region. <u>Yu inherently teaches away from the adaptive (or, for that matter, dynamic) allocation of channels</u>; Yu's invention is the computationally intensive crafting of a <u>fixed</u> channel allocation pattern that is tailored to the real-world performance metrics of each specific region.

The present invention differs significantly from both Yu and Benbeniste, and cannot be rendered obvious by their combination. While the present invention employs a fixed cell channel allocation scheme (*e.g.*, any *n*-way re-use pattern, as well known in the cellular communication arts), it is a fundamentally different fixed scheme than that of Yu. Yu's very inventive concept is the rejection of the common representation of cells as regular, adjacent hexagons, in favor of one reflecting real-world performance characteristics. Hence, the sectored cells of Yu do not teach, as the Examiner asserted, the sectored cells of the present invention.

Benbeniste rejects all fixed cell channel allocations - both Yu's and that of the present invention - in favor of an adaptive allocation based on load. To that adaptive cell channel allocation, Benbeniste adds dynamic allocation of channels <u>among cells</u> in the network. This requires network-wide monitoring of cellular traffic, as is performed by the central Operations and Management Center (OMC) in

Benbeniste, which is necessarily centrally located and includes a link to every MSC in the network (see Benbeniste, Fig. 2). In stark contrast, the dynamic allocation of channels in the present invention is between sectors of the same cell. This requires monitoring only of the load within a cell, a much more computationally tractable task that can be easily performed by, *e.g.*, the Base Station Controller 22 (see Specification, Fig. 4). This decentralized control additionally eliminates the need for costly and extraneous communication links between an OMC and each MSC. Thus, even if Benbeniste were combined with Yu - for which combination no motivation or suggestion exists - the combination would not render the present invention obvious. The Examiner has thus failed to establish a prima facie case of obviousness under § 103.

This deficiency is not cured by the further combination with Borst *et al.*, thus independent claim 6 is not rendered obvious by the combination. Similarly, further combination with Przelomiec, Komara, Reed, and/or Lea does not cure the improper combination of Yu and Benbeniste, and dependent claims 1-9, 11, and 14 are thus also patentably nonobvious over the prior art.

The Examiner rejected independent claim 10 under 35 U.S. C. § 103(a) as being unpatentable over Yu in view of U.S. Patent 6,161,024 to Komara (hereinafter, "Komara"), U.S. Patent 5,649,293 to Reed (hereinafter, "Reed"), and U.S. Patent 5,586,170 to Lea (hereinafter, "Lea"). Claim 10 is reproduced below for the Examiner's convenience:

> 10. A method for allocating channels in a sectored cell of a cellular communication system having a plurality of cells comprising:
>
> a. dividing the cell into a plurality of sectors;

b. subdividing channels allocated to the cell into frequency subgroups;

c. providing a transceiver array for each sector, wherein each said transceiver array includes a plurality of primary transceivers for channels allocated to the corresponding sector and one or more redundant transceivers <u>for channels allocated to other sectors of the cell</u>;

d. placing the primary transceivers in each sector in active mode while said redundant transceivers are placed in a standby mode;

e. allocating channels in each sector to users in that sector;

f. determining the loading of each sector of the cell;

g. when the loading in a first sector reaches a predetermined threshold, reassigning an unused channel from a second sector to the first sector;

h. placing the primary transceiver in the second cell corresponding to the reassigned channel in a standby mode; and

i. placing the redundant transceiver in the first sector corresponding to the reassigned channel in a an active mode.

The Examiner's reliance on Yu as teaching the allocation of channel groups to sectored cells (claim elements a. and b.) is inapposite to the present invention, as explained above.

Komara discloses a base station with three sets of broadband transceivers and antennae in a tri-sectored cell, with an additional (fourth) transceiver coupled to an omni-directional antenna, available as a redundant back-up to any of the three. Komara, col. 2,11. 22-39. In stating that Komara discloses claim elements c. and d., the Examiner cited to the Background section of Komara, wherein two alternative prior art redundant back-up schemes are discussed: replicating all channel-specific transceivers (Komara, col. 1, II. 18-40), and replicating the three broadband transceivers (Komara, col. 1, I. 63 - col. 2,1. 5). Neither discloses the channel-specific "redundant transceivers" of the present invention, which are explicitly limited

by the plain language of claim 10 as being "<u>for channels allocated to other sectors of the cell</u>." These redundant transceivers are not redundant back-up's to <u>replace</u> the sector's primary transceivers following failure thereof, as taught by Komara. Rather, the redundant transceivers of the present invention <u>supplement</u> the sector's primary transceivers during periods of heavy load, by adding channels borrowed from another sector. The limitation that the redundant transceivers are <u>specific to channels allocated to other sectors</u> is not only explicitly claimed, but also clearly discussed in the Specification. See all of p. 4 and the first paragraph of p. 5. See *also* Fig. 4. Claims must be read in view of the specification, of which they are a part. *Markman v.* Westview *Instruments, Inc.*, 52 F.3d 967, 34 USPQ2d 1321 (Fed. Cir. 1995) *(en banc), aff'd,* 517 U.S. 370, 38 USPQ2d 1461 (1996).

Komara thus does not disclose the redundant transceiver in standby mode as claimed in claim 10. Not only are the back-up transceivers of Komara provided for a completely different purpose - they are structurally different, in that they are inherently tuned to the same channels as the sector's primary transceivers (necessary if they are to replace them upon failure). The further combination with Reed and Lea does cure the failure of Komara to teach the redundant transceivers of the present invention, and hence claim 10 is patentably nonobvious over the cited art, as are independent claims 16, 21, and 27, all of which were rejected based on the alleged teaching of Komara. Since dependent claims 17-20, 22-26, and 28-30 include all limitations of their respective parent claims, these claims are similarly patentably nonobvious over Komara, whether combined with Yu, Reed, Lea. Borst et al.. Benveniste. and/or Przelomiec.

All pending claims in the instant application are patentably nonobvious over the prior art, and are thus in form for allowance. Reconsideration of the application in light of these remarks is hereby respectfully requested.

Respectfully submitted,

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